

A black and white photograph of a wetland or marsh. In the foreground and middle ground, there are numerous tall, slender reeds or grasses growing out of the water. The water is calm, reflecting the sky and the plants. The background is a soft, out-of-focus landscape with more vegetation and a distant horizon line. The overall tone is serene and naturalistic.

1971 OPERATING
SUMMARY

MIDLAND

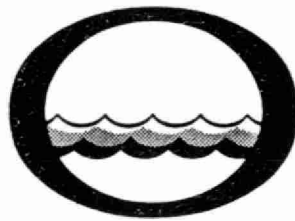
WATER POLLUTION CONTROL PLANT

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

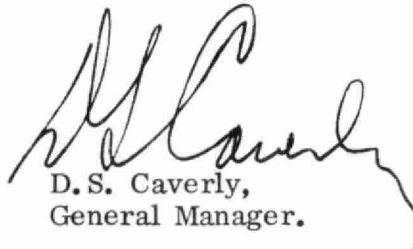



Water management in Ontario

Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in **this** summary.


D.S. Caverly,
General Manager.


D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

LIBRARY COPY

MAY 12 1972

MINISTRY OF THE
ENVIRONMENT

ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN
R. D. Johnston

VICE-CHAIRMAN
J. H. H. Root, M. P. P.

COMMISSIONERS
H. E. Brown
F. S. Hollingsworth
Dr. C. A. Martin
D. A. Moodie
L. E. Venchiarutti

GENERAL MANAGER
D. S. Caverly

ASSISTANT GENERAL MANAGERS
R. K. L. Sachse
K. H. Sharpe
F. A. Voegel
A. K. Watt

COMMISSION SECRETARY
W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

Director
D. A. McTavish

Assistant Director
C. W. Perry

Regional Supervisor
P. J. Osmond

Operations Engineer
A. Clark

135 St. Clair Avenue West
Toronto 195

MIDLAND WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF MIDLAND

by the

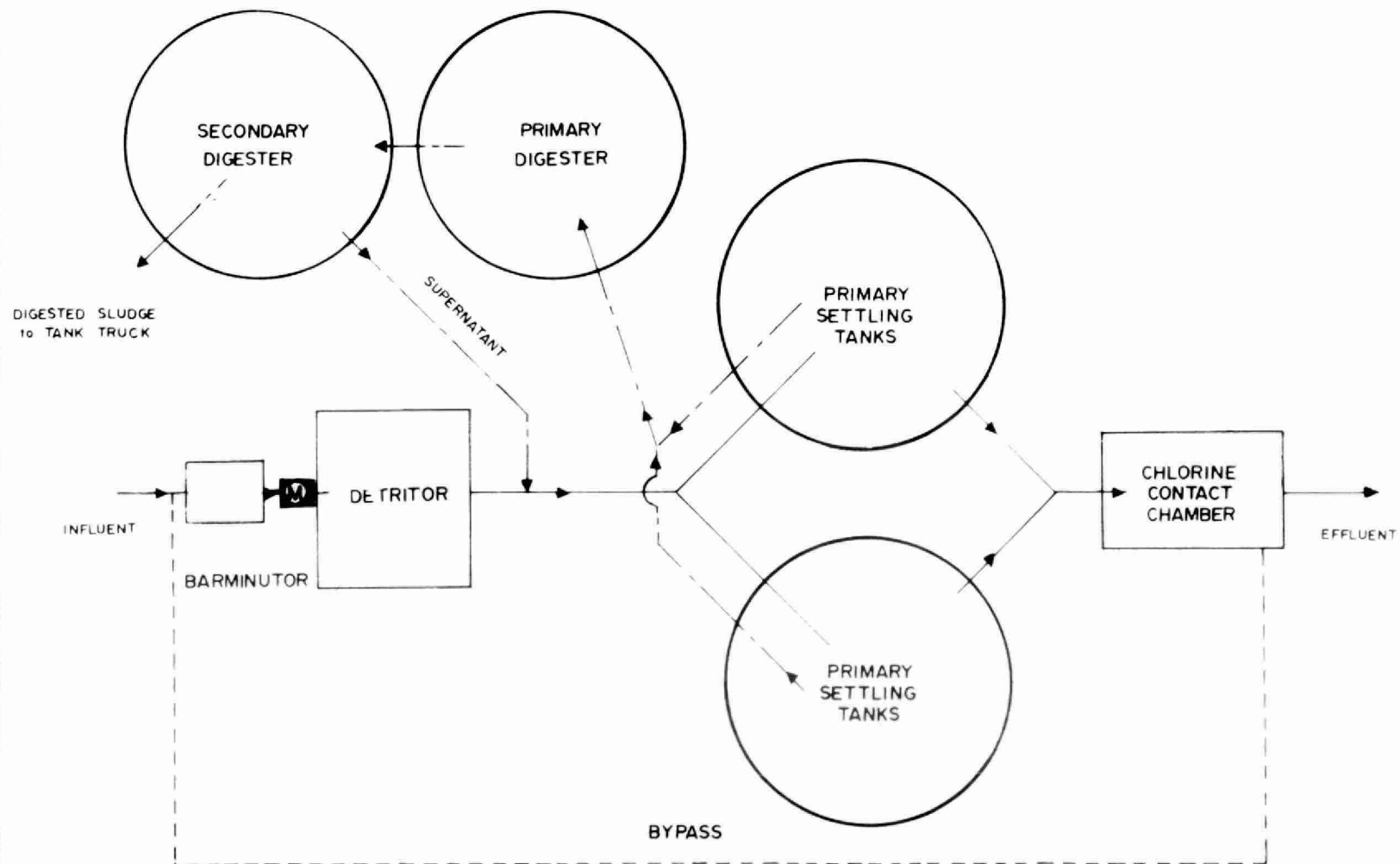
ONTARIO WATER RESOURCES COMMISSION

1971 ANNUAL OPERATING SUMMARY

CONTENTS

Title Page	. . . . .	1
Flow Diagram	. . . . .	4
Design Data	. . . . .	5
'71 Review	. . . . .	6
Project Costs	. . . . .	8
Process Data	. . . . .	11

MIDLAND WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO. 2-0146-63

TREATMENT Primary

DESIGN FLOW 1.25 mgd

DESIGN POPULATION 12,500

BOD - Raw Sewage 225 mg/l
- Removal 40%

SS - Raw Sewage 300 mg/l
- Removal 60%

PRIMARY TREATMENT

Comminution

Type: Barminutor
Size: One Model C

Grit Removal

Type: Dorr Detritor
Size: One 12' x 12' x 16"
(1,200 gal)
Retention: 1.38 min

Primary Sedimentation

Type: Dorr
Size: Two 50' dia x 8' swd
(195,000 gal)
Retention: 3.75 hours
Loading: Surface, 319 gal/ft²/day
Weir, 3970 gal/ft/day

CHLORINATION

Type: W & T, Type A711 (Auto)
Size: One 1000 lb/day

Chlorine Contact Chamber

Size: Irregular (16,200 gal)
Retention: 18.7 min

OUTFALL

615' of 24" pipe to Georgian Bay

SLUDGE HANDLING

Digestion System - Two Stage

Primary --

Type: Babcock-Wilson
Draft tube mixers (2)
Size: One 30' dia x 22' (15,600
cu ft or 97,200 gal)
Loading: 4.3 lb/cu ft/mo

Secondary --

Type: Fixed steel cover
Size: One 30' dia x 21½' (15,200
cu ft or 94,600 gal)
Total Loading: 2.2 lb/cu ft/mo

PUMPING STATIONS

#1 Pumping Station

Type: Worthington
Size: Two 780 gpm @ 37' tdh
One 2600 gpm @ 60' tdh

#2 Pumping Station

Type: Flygt (submersible)
Size: Two 83 gpm @ 30' tdh

'71 Review

GENERAL

There was a noticable increase in the average daily flow to the plant during the year. On the average, 72 percent of the daily flow equalled the hydraulic design capacity of the plant.

The average BOD reduction was 10 percent lower than the plant design reduction of 40 percent. The average suspended solids reduction was 6 percent greater than the design value of 60 percent.

The plant won the best plant award in 1971.

PLANT FLOWS and CHLORINATION

The total estimated flow to the plant was 511.0 million gallons. The average daily flow to the plant was 1.4 million gallons and at various times the plant received raw sewage at a maximum flow rate of 5.1 million gallons per day.

A total of 33,600 pounds of chlorine were used to maintain a residual in the plant effluent of 0.5 mg/l with an average dosage of 6.7 mg/l.

PLANT EFFICIENCY

The influent BOD and suspended solids were 106 mg/l and 193 mg/l respectively. The effluent contained 74 mg/l BOD and 66 mg/l suspended solids. These results represent an average reduction of 30 percent BOD and 66 percent suspended solids.

Total phosphorous removal averaged 40 percent for the year.

SLUDGE DIGESTION and DISPOSAL

A total of 1,121,000 gallons of sludge was deposited in the digester from the primary clarifiers. The raw sludge averaged 11.5 percent total solids of which 43 percent were volatile solids. During the year 307,000 gallons of digested sludge were hauled from the digester by a private contractor for disposal on the land. This sludge contained 9.3 percent total solids of which 32 percent were volatile solids.

CONCLUSIONS

With the increased flows experienced, the plant efficiency was slightly upset. However, with the average daily flows equalling the plant's hydraulic design capacity, 72 percent of the time, steps should be taken in the near future to enlarge the plant capacity.

PROJECT COSTS

NET CAPITAL COST (Final)	\$822, 029.32
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>496, 399.44</u>
Long Term Debt to OWRC	<u>\$325, 629.88</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	\$ <u>48, 912.32</u>
Net Operating	\$ 37, 868.34
Debt Retirement	3, 838.00
Reserve	4, 297.75
Interest Charged	<u>18, 264.85</u>
TOTAL	\$ <u>64, 268.94</u>

RESERVE ACCOUNT

Balance @ January 1, 1971	\$ 27, 253.59
Deposited by Municipality	4, 297.75
Interest Earned	<u>1, 843.74</u>
	\$ 33, 395.08
Less Expenditures	<u>1, 451.80</u>
Balance @ December 31, 1971	\$ <u>31, 943.28</u>

OPERATING COSTS

● PAYROLL	48 %
● FUEL	2 %
● POWER	9 %
● CHEMICALS	10 %
● GENERAL SUPPLIES	4 %
● EQUIPMENT	2 %
● REPAIRS & MAINTENANCE	10 %
● SUNDRY	12 %
● WATER	2 %
● TRAVEL	< 1 %

1971 COSTS

TOTAL ANNUAL COST

NET OPERATING	% 59 ●
DEBT RETIREMENT	% 6 ●
RESERVE	% 7 ●
INTEREST	% 28 ●

YEARLY OPERATING COSTS

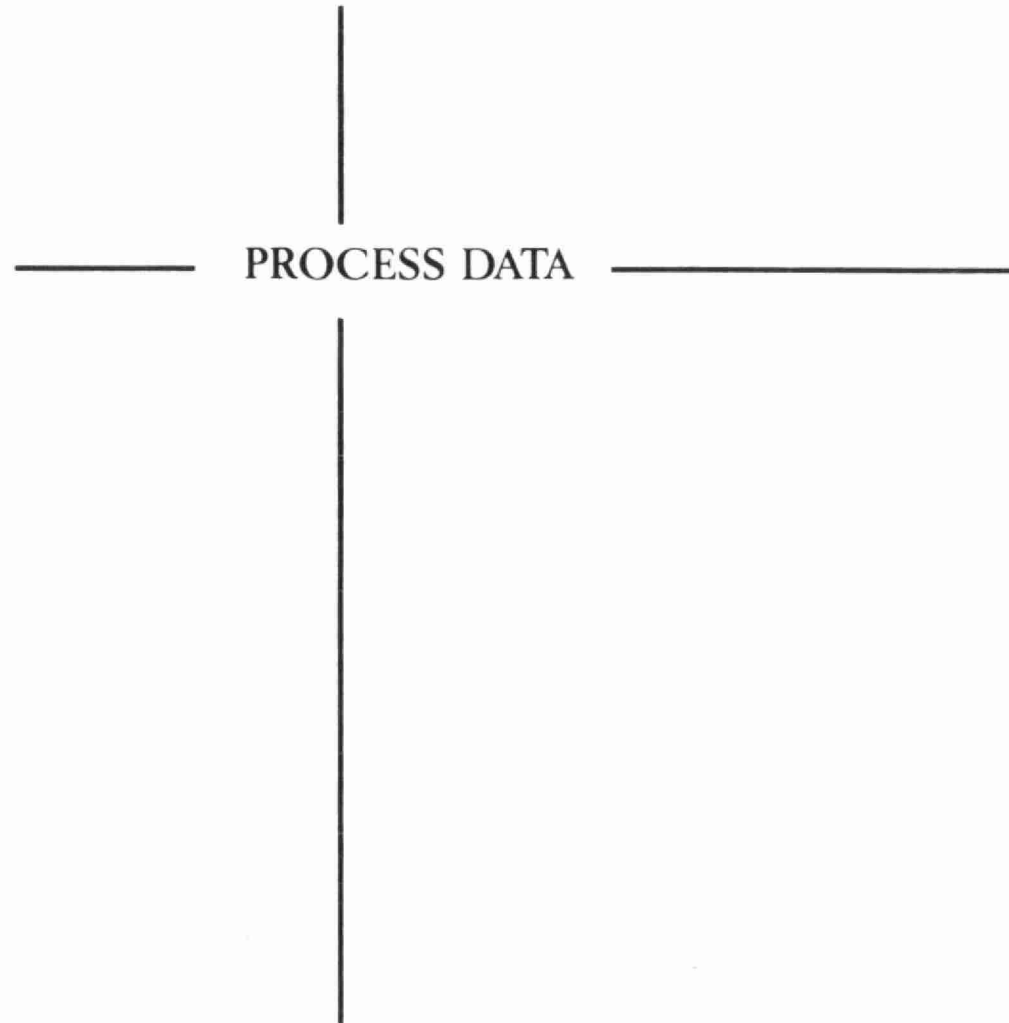
YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			\$ per million gal	¢ per lb BOD
1967	480.65	\$25,872.10	\$53.83	12 cents
1968	497.54	28,281.17	56.84	17 cents
1969	488.0	35,187.35	72.11	26 cents
1970	485.4	34,075.73	70.20	14 cents
1971	511.0	37,863.28	74.10	24 cents

MONTHLY OPERATING COSTS

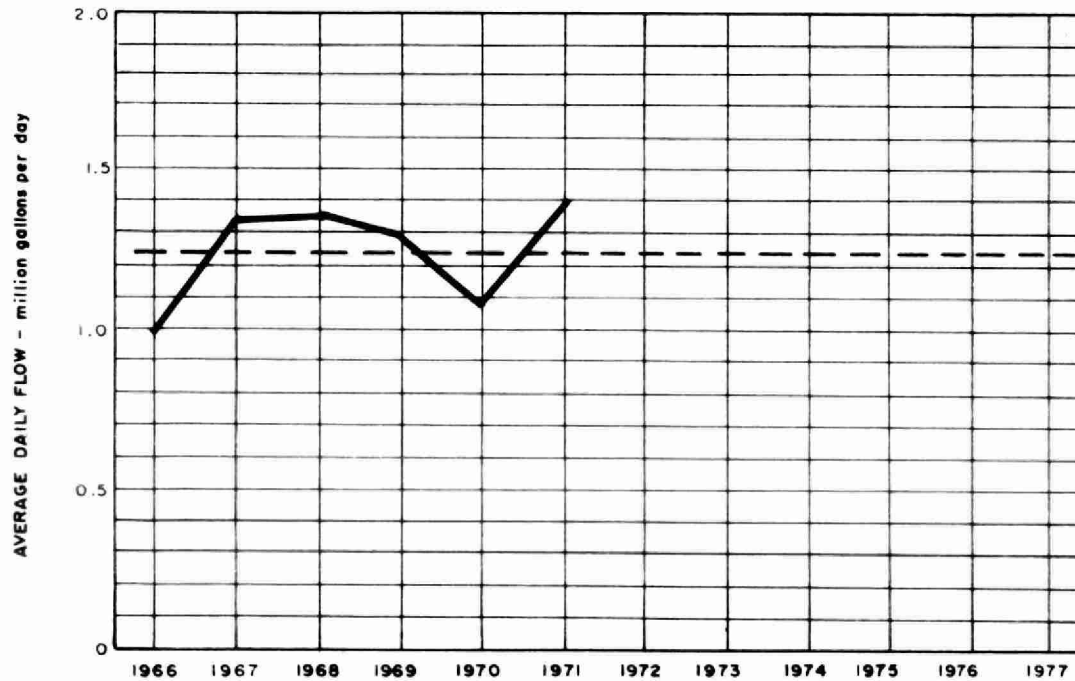
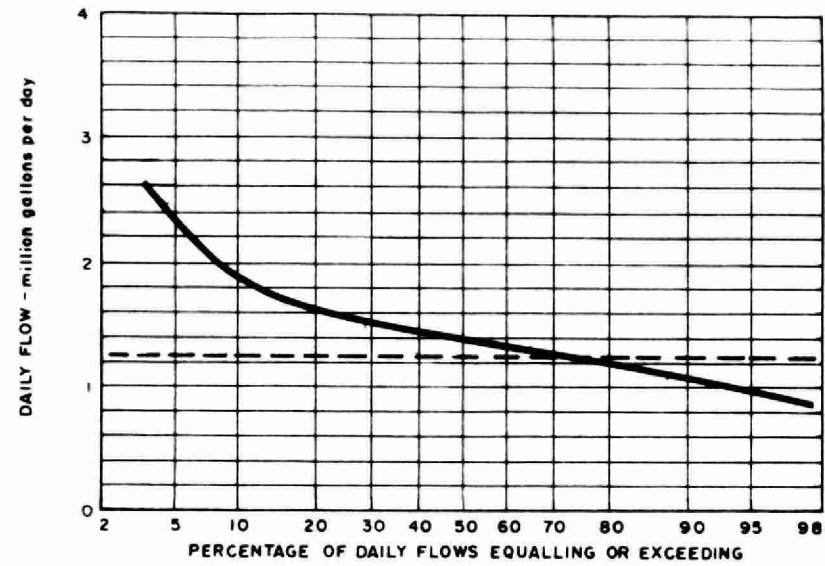
MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	1745.15	1262.24	17.42	36.92	304.44	-	112.23	-	-	11.90	-	-
FEB	3093.15	1808.95	-	38.30	332.77	-	117.82	-	410.51	200.25	184.55	-
MAR	4122.72	1193.57	-	237.97	298.59	1352.40	70.57	-	507.07	462.55	-	-
APR	2413.13	1228.60	72.88	82.67	329.60	-	89.97	234.01	37.02	338.38	-	-
MAY	2818.17	1387.78	167.92	53.59	363.36	-	174.75	109.15	103.29	349.17	109.16	-
JUNE	2842.93	819.74	62.16	46.30	272.35	-	253.77	359.97	585.97	430.57	12.10	-
JULY	2192.56	1260.97	93.80	39.86	293.35	-	58.27	-	83.38	362.93	-	-
AUG	2035.22	1337.85	74.84	53.43	265.03	-	60.14	-	221.98	21.95	-	-
SEPT	3726.73	1385.10	54.55	39.86	301.63	-	122.88	2.86	469.14	1345.01	-	5.70
OCT	2754.95	1639.47	58.72	20.13	258.88	53.55	145.93	-	261.52	18.10	298.65	-
NOV	4575.93	2014.29	36.00	35.20	250.63	821.20	75.81	16.20	609.37	621.10	-	96.13
DEC	5542.64	2281.56	36.23	41.41	307.55	1746.00	186.47	-	624.36	316.16	-	2.90
TOTAL	37863.28	17620.12	674.52	725.64	3578.18	3973.15	1468.61	722.19	3913.61	4478.07	604.46	104.73

Brackets indicate credit.

* Sundry includes sludge haulage costs of \$3,019.50



FLOWS



DESIGN CAPACITY _ _ _ _ _

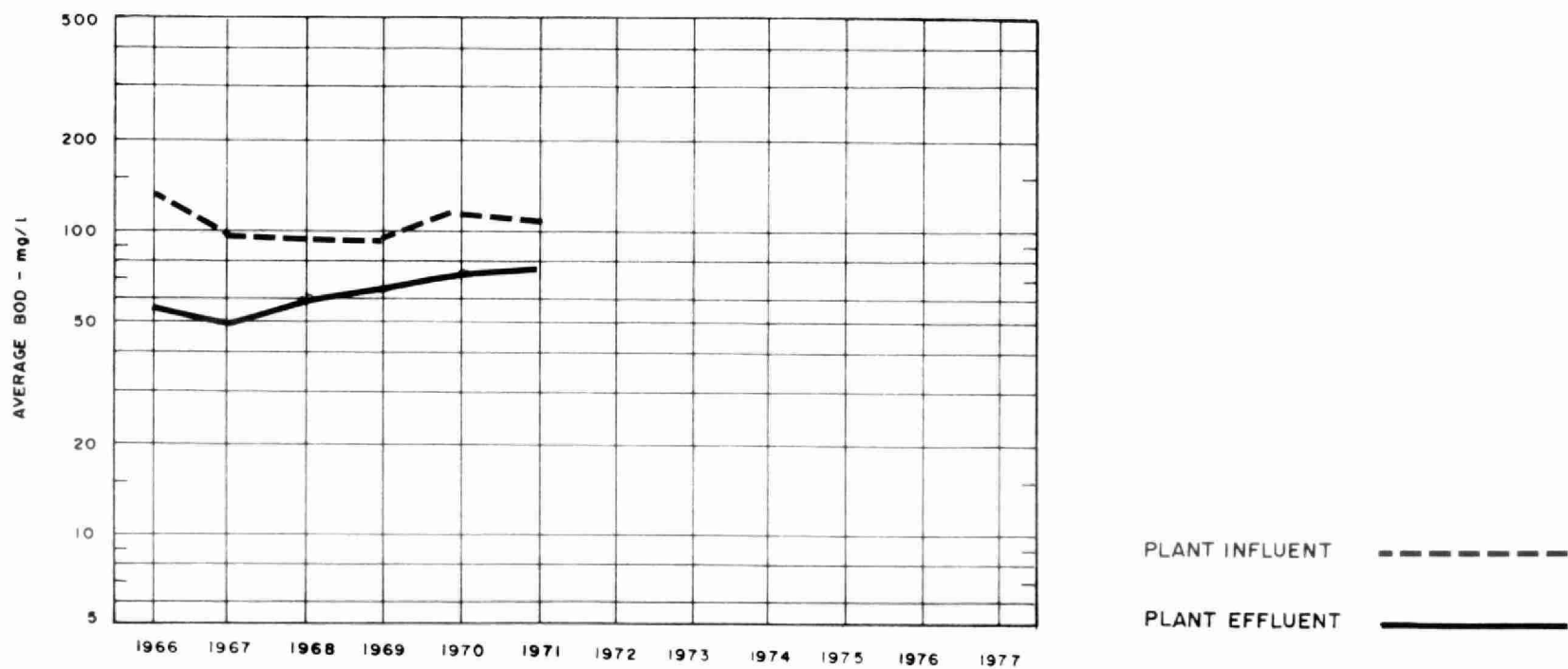
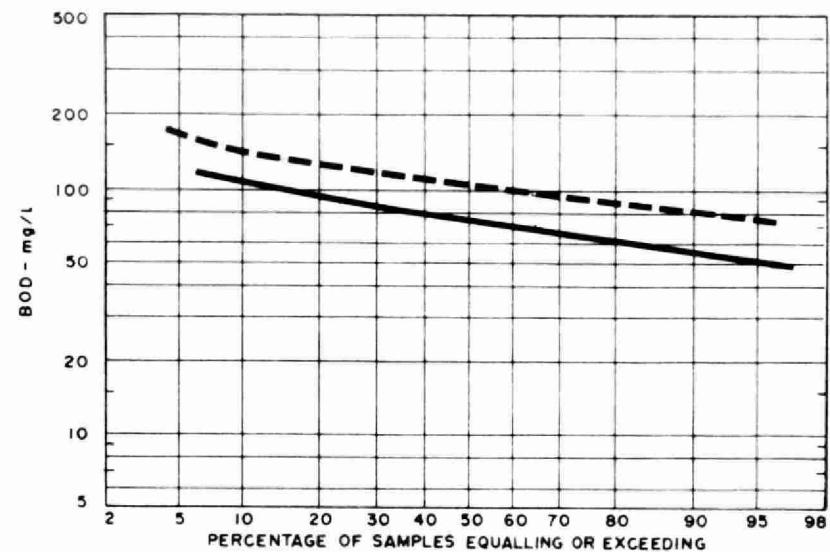
PLANT PERFORMANCE

MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS		
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	MAXIMUM RATE	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION
	million gallons	mil gal	mil gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l as P	mg/l as P	%
JAN	35.8	1.2	1.4	2.3	132	70	47	22.	180	85	53	34.	7.3	7.4	-
FEB	35.6	1.3	2.0	3.6	92	82	11	4.	205	75	63	46.	11.8	7.2	39
MAR	46.4	1.5	1.5	4.5	90	59	34	13.	230	70	70	74.	13.0	8.3	36
APR	52.5 a	2.6	4.1	5.1	80	65	19	8.	150	60	60	47.	13.4	7.7	43
MAY	o/s	-	-	-	97	55	44	-	183	90	51	-	20.0	11.4	43
JUNE	31.3 b	1.4	1.7	5.1	115	97	15	6.	223	48	78	54.	18.0	11.2	38
JULY	39.5	1.3	1.9	4.9	130	75	42	22.	175	65	63	43.	11.3	5.8	49
AUG	48.8	1.3	1.7	4.9	110	55	50	27.	150	60	60	44.	13.0	12.0	77
SEPT	70.8	1.4	1.7	4.2	110	77	30	13.	230	55	76	71.	18.5	10.9	41
OCT	45.1	1.5	1.7	4.8	110	75	32	16.	180	60	67	54.	12.5	10.8	14
NOV	42.7	1.4	1.7	4.5	110	90	18	9.	190	60	68	55.	18.0	13.5	25
DEC	45.2	1.5	2.5	4.7	90	80	11	4.	220	50	77	77.	27.0	9.4	65
TOTAL	511. est	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AVG.	-	1.4	MAXIMUM 4.1	MAXIMUM 5.1	106	74	30	13.	193	66	66	54.	16.1	9.7	40
No. of Samples	-	-	-	-	22	22	-	-	22	22	-	-	22	21	-

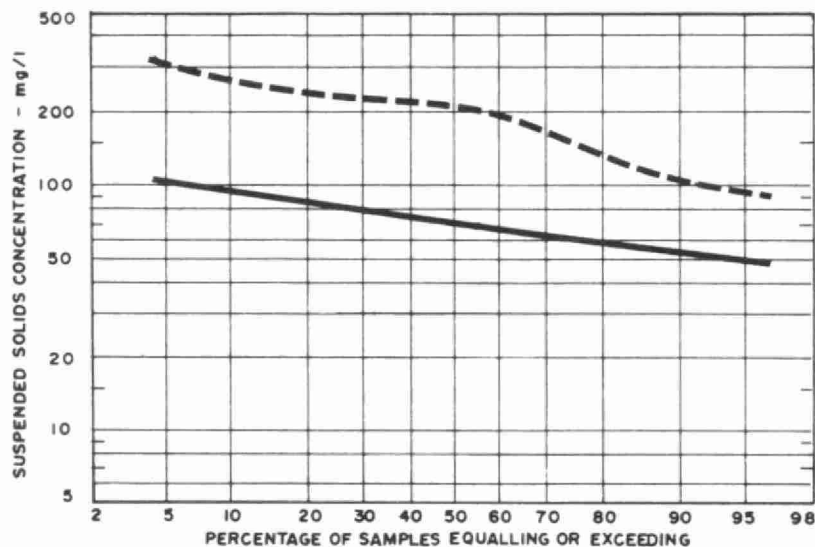
a - 20 day's flow data

b - 23 day's flow data

BIOCHEMICAL OXYGEN DEMAND

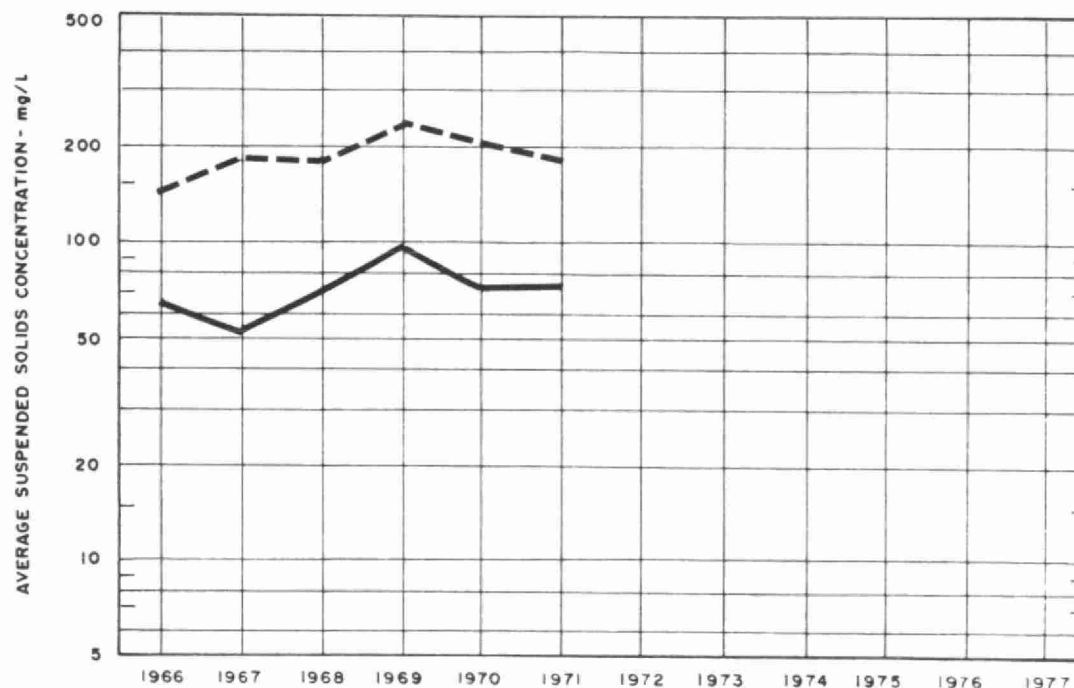


SUSPENDED SOLIDS



PLANT INFLUENT - - - - -

PLANT EFFLUENT _____

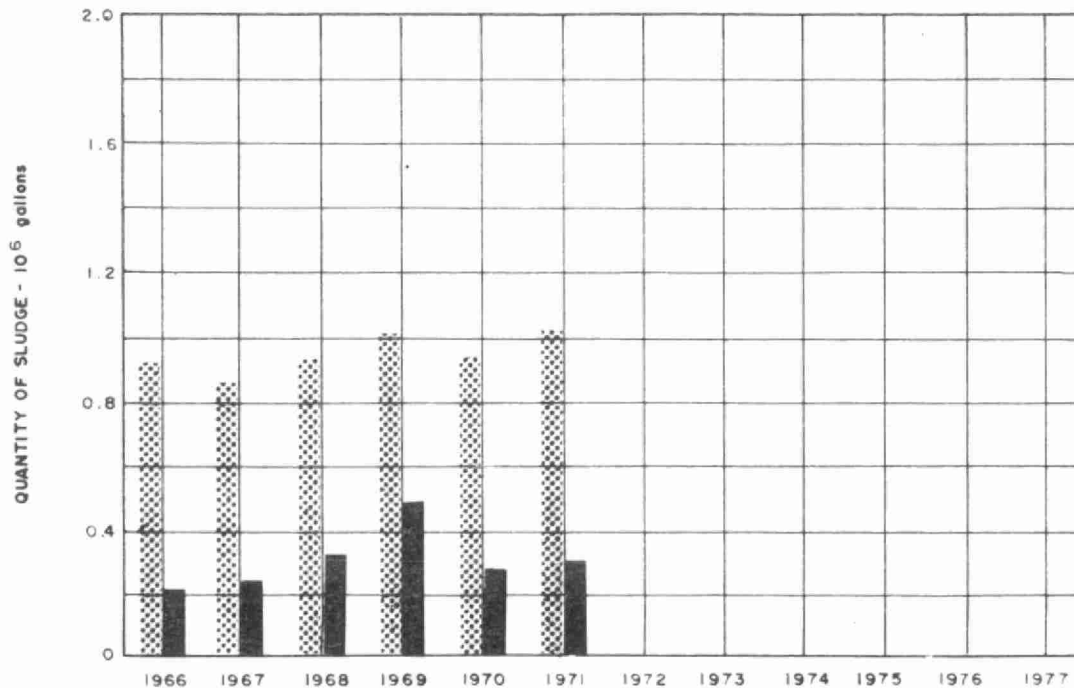
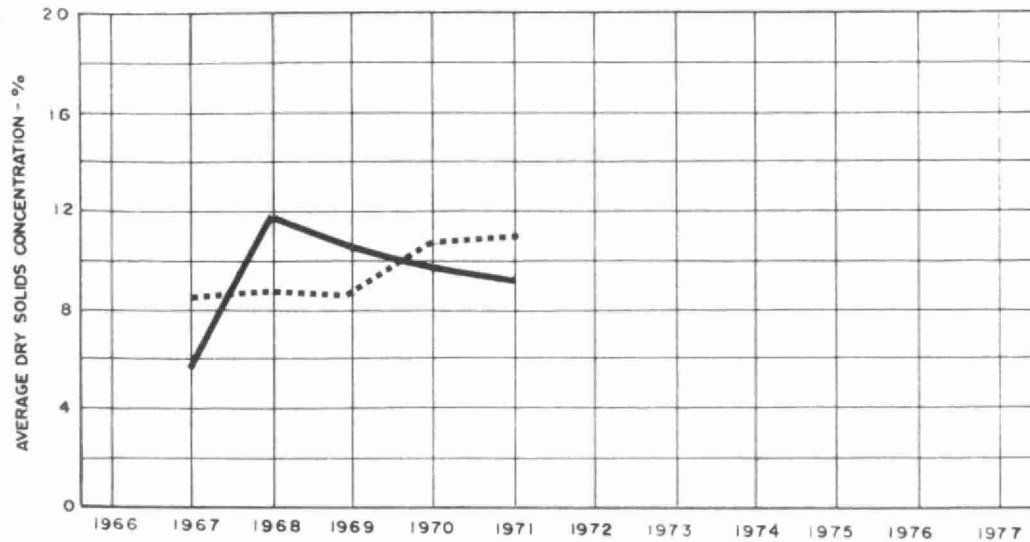


TREATMENT DATA

MONTH	GRIT QUANTITY REMOVED cubic feet	CHLORINATION		SLUDGE DIGESTION and DISPOSAL							
		CHLORINE USED 10 ³ pounds	AVERAGE DOSAGE mg/l	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT	SLUDGE HAULED cubic yards
				QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	QUANTITY REMOVED 10 ³ gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	TOTAL SOLIDS %	
JAN	15	2.1	5.9	73.	12.4	47	12.	9.5	29	-	72
FEB	18	2.2	6.1	64.	12.0	56	21.	10.6	32	3.3	126
MAR	51	3.0	6.5	87.	10.1	36	36.	8.5	33	-	210
APR	69	3.1	3.9	90.	18.4	34	32.	9.9	30	.5	186
MAY	18	2.6	-	90.	11.2	53	30.	9.3	31	3.2	180
JUNE	46	2.8	7.3	98.	12.1	40	26.	10.2	29	.3	156
JULY	93	2.4	6.1	104.	6.9	48	32.	14.0	30	.3	161
AUG	53	3.1	6.3	98.	18.2	34	20.	10.8	36	-	205
SEPT	32	3.0	7.3	111.	17.3	45	30.	7.6	34	-	180
OCT	30	3.2	7.0	93.	7.7	51	25.	6.5	-	-	150
NOV	25	3.1	7.3	100.	9.4	43	19.	6.7	36	4.0	114
DEC	31	3.0	6.7	113.	5.4	36	24.	7.7	-	-	144
TOTAL	481	33.6	-	1121.	-	-	307.	-	-	-	1884
AVG.	.94 cubic feet/mil gal	2.8	6.7	93.	11.7	43	25.	9.3	32	1.9	157

DIGESTION

RAW SLUDGE
DIGESTED SLUDGE ———



RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED ———

[illegible]